REMARKS

In response to the Patent Office Action of May 20, 1999, the Applicants respectfully request reconsideration. The claims as now presented are believed to be in allowable condition. Claims 17-20 were previously pending in this application. No claims have been amended, added or canceled. Claims 17-20 remain for examination.

Claims 17-20 have been rejected under 35 U.S.C. §103(a) as unpatentable over Gaeris et al., Beaver, Davis, or Eilhardt et al., in view Bryan et al., Staschewski, and Davis et al. This rejection is traversed as follows.

The Examiner states:

> It is agreed that no reference explicitly suggests a detailed method as claimed including aligning the elements with the core for making a cable as in the primary references. However, and as acknowledged by applicant, the ordinary artisan would have been motivated by primary references to adopt or select a method in which such alignment is assured...

The Examiner goes on to quote Applicants' statement.

First, the Applicants point out that the referenced statement responds to the initial office action, addressing a different issue. The Examiner had raised an issue of the obviousness of the need for geometric positioning of cable elements. In other words the elemental positioning as referenced from a cross-sectional view of a cable perpendicular to its longitudinal axis. Applicants continue to agree that a method of alignment is desired. This is routinely accomplished in the industry with the use of a 'die-plate', a device with multiple orifices arranged in a somewhat concentric lay-up on a metal plate, allowing free-spinning cable elements to be physically pre-positioned prior to final closing.

However, there are many ways to 'bundle' cable elements into a formed cable, the two most common methods being 'bunching', where elements are pulled through the die-plate into a rotating take-up, and, 'planetary cabling', where elements are rotated about the cable's longitudinal axis, and where the take-up is not rotating perpendicular to the cable axis.

It should be noted that by its very nature, the bunching apparatus inherently causes a 'back-twisting' effect within the cable elements, and indeed, as is known to skilled artisans, this effect is often used to further twist pre-twisted pairs in order to obtain the designed finished par lay. This back-twisting effect can only be negated through the use of neutralizing (i.e., rotating) pay-offs, where the pay-off rotates in the same direction and with the same speed as the take-up, thereby providing a net zero back-twisting effect within the individual cable elements. A conventional 'bunching' operation causes a calculable amount of back-twist to occur in all elements that are not neutralized as previously described so that a channeled pre-form would back-twist at a rate equal to that of the other cable elements. This effect would require that the pairs be inserted along the axis of the cable at a longitudinal axis separation equal to one full helical revolution of the channel helix. This arrangement is inconvenient and more difficult to set up than the arrangement claimed.

In a planetary cabling scenario, each pay-off, usually housed in a reel cradle, travels around the longitudinal axis of the cable as it moves forward and toward the take-up reel, thereby traveling helically about the cable axis. If a pre-formed, grooved core were pulled through the middle of the above scenario, each element could not be disposed within the appropriate channel. Therefore, this conventional system and

method would use a pre-twisted core, having a helical twist of the same period as the finished cable. Additionally, the insertion of each element would, by necessity, take place along the axis of the cable at a longitudinal separation equal to one full helical revolution of the channel helix. For an example, please see G. W. Thelin, U.S. Patent No. 2,501,457, Figure 4. The diagram shows that the elements are not being applied at the exact same point relative to the longitudinal axis. Again, the arrangement is less convenient and more difficult to implement than the claimed invention.

Another fairly straightforward method of inserting elements into channels could be used if no helix was required in the pre-formed core and no further twisting required on pre-twisted elements. As the non-helixed core moves toward a take-up reel, pre-twisted elements could be placed within the longitudinal channels. However, the claim requires "twisting."

In the manufacture of modern high-speed data cable, it is desirable to build a cable with the finest pair to pair balance possible. This objective is hampered when axial forces due to required tensioning during cable manufacture impart residual stress within a cable core.

The present invention allows the manufacture of the subject cable using a modified 'bunching' method that allows cable elements to be introduced within core channels of a pre-formed core at an equal distance along the cable longitudinal axis, while still allowing the use of pre-determined back-twisting to cable pairs. The method allows for finely balanced application stresses while still using conventional back-twisting bunch technology. Thus, significant advantages are observed using the claimed invention as compared to the methods described above.

Reiterating that the standard 'bunching' method causes a calculable amount of back-twist to occur in all elements that are not neutralized, it should be noted that the effect continually occurs along each element, including a pre-formed core, staring from the final closing point, and ending at the pay-off, which could be 10 feet or more away.

Applicants achieve a net zero force applied to the channeled pre-form by interrupting the back-twisting effect of the pre-form at a point near the final closing die, so that all elements (i.e., the twisted conductor pairs) enter parallel, non-helixed channels at an essentially equal distance along the core axis, providing a desired balancing of stress forces. This allows the continual back-twisting to occur within the other cable elements.

The claim language which supports patentability as described above, includes, but is not limited to the following. Claim 17 requires steps of "bunching" and "twisting...to close the cable." As explained above, both bunching and twisting are known. The conventional method for combining these steps includes the use of neutralizing payoffs, also as explained above. In contrast, the claim requires "passing a plurality of transmission media and a core through a first die which aligns the plurality of transmission media with surface features of the core and prevents twisting motion of the core." As discussed in Applicants' previous response and above, the prior art teaches a different method of solving the problems of bunching and twisting a cable to close it. Therefore, the claim language clearly distinguishes over the cited art.

In view of the significant advantages obtained using the present invention, and the lack of teaching of the claimed arrangement or its advantages over the prior art, the claims are non-obvious in view of the applied art.

Conclusion and Request for Reconsideration

Reconsideration of claims 17-20 is respectfully requested.

In view of the foregoing remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. Should further questions arise concerning this application, the Examiner is invited to call Applicants' representative at the number listed below.

If the filing of this paper necessitates an extension of time or any future paper filed in this case, such an extension of time through the filing date of this paper is respectfully requested.

The Commissioner is hereby authorized to charge any additional fees, which may be required under 37 C.F.R. §§1.16 or 1.17, or credit any overpayment to Deposit Account No. 23-2825.

Respectfully Submitted,

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